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THE number of students in the school of biology of the University of Pennsylvania has greatly increased. More than 300 students are taking the biological courses, about one-third of these being women.

THE Spring Garden Institute of Philadelphia has received a gift of \$100,000 from the heirs of Samuel Jeanes, who supported the Institute with great generosity during his lifetime.

M. H. WHITE, of Cincinnati, and his brother, F. T. White, of New York, have given \$25,000 to Earlham College at Richmond, Ind., in memory of their father, the late John T. White. The College is supported by the Society of Friends.

DR. A. H. THORNDIKE has been appointed instructor in mathematics in Boston University.

DR. G. P. GRIMSLEY, of Topeka, Kansas, has accepted the professorship of geology and natural history in Washburn College.

LAFAYETTE COLLEGE will hold a celebration on October 24th in honor of Professor Francis A. March, the distinguished philologist, who this fall completes his seventieth year and forty years of service in the College. The exercises will begin at 11 a. m., in the auditorium of Pardee Hall, ex-President W. C. Cattell presiding, and will consist of an address by Professor W. B. Owen on Dr. March and his work for Lafayette, and several addresses by Dr. March's fellow laborers in the field of English language and philology; Dr. Wm. T. Harris, U. S. Commissioner of Education; Professor T. R. Lounsbury, of Yale; Professor J. W. Bright, of Johns Hopkins, and Professor Thos. R. Price, of Columbia.

LEHIGH UNIVERSITY celebrated Founder's Day on Thursday, October 10th. An address was delivered in the Packer Memorial church by the President, Dr. Thomas M. Drown.

THE Council of University College, Dundee, has appointed to the new Harris chair of physics Dr. J. P. Kuenen, Ph. D., of the University of Leyden, Holland.

MR. GEORGE SAINTSBURY has been appointed professor of rhetoric and English literature in the University of Edinburgh.

DR. W. BIEDERMANN, professor of physiology at Jena, has received a call to the University at Graz. Dr. Adolf Heydweiller, of Strassburg, has been made assistant professor of physics in the University of Breslau.

DR. OTTO JAEKEL has been promoted to be a professor of paleontology at Berlin.

CORRESPONDENCE.

PROFESSOR BROOKS ON CONSCIOUSNESS AND VOLITION.

IN SCIENCE of October 4th Professor Brooks has a letter on two communications in previous numbers by Professor Gage, of Cornell University, and myself, in which he expresses objections to them. It is necessary that I state the names of the authors of these articles, as Professor Brooks unaccountably does not do so.

Professor Brooks' objection is to a supposed assumption of knowledge on the part of these persons which he is sure that they do not possess, and he is willing to characterize their assumption by no worse a term than 'poetry.' In any case, he says, it is not science. His objections extend not only to the papers criticised, but to the societies which are supposed to have endorsed such views by electing one of their authors 'many times president;' they will logically extend also to the societies who have elected the other one president, though Professor Brooks does not refer to them.

Professor Brooks' specific objection is to the assumption that "consciousness and volition can cause structure or anything else." He also varies the proposition thus: "If we admit, as I think we must, that for all we know an oak tree may have volition and may do as it likes, what evidence is there that it ever likes to do anything which it would not do in any case by

virtue of its structure even if it were unconscious."

I have much respect for Professor Brooks' abilities and work as a biologist, but in the above sentences he commits the common error of confounding volition with consciousness in a way which will surprise any student of mental phenomena. I am not aware that any well-read person in modern times has proposed the hypothesis that 'volition,' or doing 'as it likes,' is a property of the vast majority of protoplasm, while every naturalist knows that consciousness is a property of protoplasm, though not of all protoplasm so far as our means of observation permit us to judge. Students of cells and tissues are very frequently not students of consciousness, and I will therefore add another commonplace of psychology, and that is that the responses of conscious protoplasm to stimuli are as strictly regulated by necessity as the responses of unconscious protoplasm, though the necessity is of a different kind.

The proposition that a muscular contraction is influenced, *i. e.*, directed by a conscious state, may be a matter of mere opinion, or it may be a working hypothesis, or it may represent a fact. Mankind generally, including many scientific men, hold it to be a fact. Lord Kelvin, according to Prof. Gage, is of this number, though he calls it a 'miracle.' However, Prof. Brooks will probably allow that it is a permissible working hypothesis, although he does not say so directly. If we grant that it is true of man, which most of us do, no one has yet shown where the line is to be drawn, as we descend the scale of animal life, at which sensation ends. In fact, centers of special sense are alleged to exist in many Protozoa, and if special sensation exists it is probable that general sensation exists still lower down in the scale.

As to whether such sensation, if it exists, has any effect on structure, the reasons for thinking that this occurs through the medium of movements have been stated so often that it is not necessary to repeat them here. I only refer for a resumé of some of the evidence to a book by myself which will probably be issued by the Open Court Publishing Co. by the beginning of next month.

A common source of obscure thinking among

naturalists is the assumption that reflex and automatic acts disprove the agency of conscious states in the direction of movements. Evolutionists, however, look for the origin of things, and some of them find consciousness, as a cause of the direction of new movements now, to be an equally supposable cause of new movements at former periods of the earth's history. Here we have again a legitimate working hypothesis; although it is not necessary to account for all the movements of organic matter.

Of course, the opposing view to the hypotheses above mentioned involves the assumption of their falsity. To give the opposite position the standing in court adopted by Professor Brooks, I quote him with variations, as follows: "If the learned bodies which give their allegiance to the utterances I have quoted will publish the evidence that consciousness and volition can" influence Professor Brooks when he writes a learned article, or makes an address on a biological subject, "they will not only demonstrate their own scientific eminence, but by settling a question which has never ceased to vex the mind of man they will make the closing years of the nineteenth century memorable for all time," etc. Thinkers will adopt one or the other of these hypotheses as they see fit, but when they touch the metaphysical side of the question they must give to it that attention which it deserves.

Professor Brooks' plea for suspense of judgment is wise. But the formulation of a hypothesis need not alarm him. Builders generally know the difference between the scaffolding and the building. And a builder will value the indication of faults in his scaffolding rather than general disquisitions on the uselessness of scaffolds in general.

E. D. COPE.

P. S. I hope to make shortly some comments in the pages of the *American Naturalist* on previous articles in *SCIENCE* by Profs. Baldwin and Cattell.

ABSORPTION OF TERRESTRIAL RADIATIONS BY THE ATMOSPHERE.

I AM certainly glad that Prof. Davis (*SCIENCE* p. 485, Oct. 11, 1895) objected to the extreme terms which I used in referring to the blanket-effect of our atmosphere. I object to them